

**Notice of Allowability**

Application No.

09/670,250

Examiner

Omar Rojas

Applicant(s)

COHEN ET AL.

Art Unit

2874

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the telephone interview conducted on August 1, 2005.
2. ☒ The allowed claim(s) is/are 1,7,8,10-12,16-21,23 and 26-30.
3. ☐ The drawings filed on \_\_\_\_\_ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |  |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                              |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date <u>0805</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                                      |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance                     |
|   | 9. <input type="checkbox"/> Other _____.   |

### EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Stanley Ference III on August 1, 2005.

The application has been amended as follows:

#### IN THE CLAIMS:

Cancel claims 2-5, 14, 22, 24, and 25.

Amend claims 1, 12, 16, 18, 19, 20, 21, and 23 as follows:

1. **(Currently Amended)** An apparatus for guiding at least one optical path for an optoelectronic transceiver, said apparatus comprising:

an input interface;

an output interface;

at least one continuous fiber having a constant core diameter being disposed between said input and output interfaces;

said at least one continuous fiber being adapted to provide at least one optical path;

said at least one continuous fiber having at least one bent element being adapted to avoid premature mechanical failure; and

Art Unit: 2874

said at least one bent element comprises at least one optoelectronic fiber,

wherein adapting said at least one bent element to avoid premature mechanical failure comprises baking said at least one optoelectronic fiber; ~~and ,~~

wherein said at least one bent element includes a bending radius of less than about 2.5 mm, and

wherein said at least one optoelectronic fiber is integrally adhered to said input and output interfaces via baking.

12. **(Currently Amended)** A method of forming apparatus for guiding at least one optical path for an optoelectronic transceiver, said method comprising the steps of:

providing an input interface;

providing an output interface;

disposing at least one continuous fiber having at least one bent element with a constant core diameter between said input and output interfaces, ~~wherein said fiber is optoelectronic;~~

adapting said at least one continuous fiber to provide at least one optical path; and

adapting said at least one bent element to avoid premature mechanical failure,

wherein said step of providing at least one bent element comprises providing at least one optoelectronic fiber,

Art Unit: 2874

wherein adapting said at least one bent element to avoid premature mechanical failure comprises baking said at least one optoelectronic fiber; ~~and~~ ,

wherein said at least one bent element includes a bending radius of less than about 2.5 mm, and

wherein said at least one optoelectronic fiber is integrally adhered to said input and output interfaces via baking.

16. **(Currently Amended)** The method according to ~~Claim 15~~ Claim 12, wherein said step of baking, related to avoiding premature mechanical failure, comprises baking in an oven in air at between about 1000 and about 1100 degrees Celsius.

18. **(Currently Amended)** The method according to ~~Claim 15~~ Claim 12, wherein:  
  
said step of providing at least one optoelectronic fiber comprises providing a buffer layer on said at least one optoelectronic fiber; and  
  
during said baking step, related to avoiding premature mechanical failure, said buffer layer is burned off.

19. **(Currently Amended)** The method according to ~~Claim 15~~ Claim 12, wherein:  
  
at least one of said input interface and said output interface comprises silicon;  
  
said baking step, related to avoiding premature mechanical failure, comprises anchoring said at least one optoelectronic fiber to at least one of said input interface and said output

Art Unit: 2874

interface via SiO<sub>2</sub> sintering.

20. **(Currently Amended)** The method according to ~~Claim 15~~ Claim 12, wherein said steps of providing an input interface and said step of providing an output interface comprise providing a base element and a cover element, said base element and said cover element combining to form said input interface and said output interface.

21. **(Currently Amended)** The method according to Claim 20, wherein:

said cover element and said base element comprise silicon;

said baking step, related to avoiding premature mechanical failure, comprises anchoring said cover element and said base element to each other via SiO<sub>2</sub> sintering.

23. **(Currently Amended)** A method of forming apparatus for guiding at least one optical path for an optoelectronic transceiver, said method comprising the steps of:

providing an input interface;

providing an output interface; and

providing at least one waveguide between said input and output interfaces,

wherein said at least one waveguide is etched from at least one glass sheet;

wherein said step of providing at least one waveguide further comprises

providing a silicon wafer; and

Art Unit: 2874

mounting said at least one glass sheet on said silicon wafer,

wherein said mounting step further comprises providing an adhesive and bonding said at least one glass sheet to said silicon wafer using said adhesive;

adapting said at least one waveguide to provide at least one optical path;

adapting said at least one waveguide to avoid premature mechanical failure;

wherein said at least one waveguide includes a bend radius of less than about 2.5 mm.

26. **(Currently Amended)** The method according to Claim 2223, wherein said step of providing at least one waveguide further comprises the step of depositing an etch-masking layer on said at least one glass sheet.

Art Unit: 2874

***Election/Restrictions***

The restriction requirement made final in the Office action mailed March 23, 2005 is hereby withdrawn. All pending claims have been examined on the merits.

***Reasons for Allowance***

The following is an examiner's statement of reasons for allowance: The claims are directed to achieving low bending radii for optical fibers and optical waveguides.

Regarding claims 1, 7, 8, 10-12, 16-21, and 29-30, Patent No. 5,699,461 to Minemoto et al. ("Minemoto") is the closest available prior art. The Minemoto patent discloses a method of heating an optical fiber to achieve a bending radius of 0.3 to 15 mm (col. 8, line 48 to col. 9, line 37). However, the Minemoto patent does not teach or suggest integrally adhering at least one optical fiber to input and output interfaces via baking as recited by independent claims 1 and 12. It is also the position of this examiner that it would not have been obvious to modify Minemoto to include the aforementioned baking step absent the applicant's own teachings. Thus, claims 1, 7, 8, 10-12, 16-21, and 29-30 are deemed allowable.

Regarding claims 23 and 26-28, Patent Publication No. 2001/0024547 to Huang et al. ("Huang") is considered the closest available prior art. The Huang publication discloses etching a glass layer to produce an optical waveguide and achieving a bend radius of less than 100 microns (col. 4, line 57 to col. 6, line 16). However, the Huang publication does not teach or suggest bonding the glass layer to the silicon wafer using an adhesive as recited by independent claim 23. Instead, the Huang publication teaches using flame hydrolysis to attach the glass layer to a buffer layer (col. 4, lines 59-65). It is the position of this examiner that it would not have

Art Unit: 2874

been obvious to modify Huang to include the aforementioned adhesive bonding step absent the applicant's own teachings. Thus, claims 23 and 26-28 are deemed allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Patent No. 4,812,001 to Tomita et al. discloses a method of achieving small bend radii in optical fibers via heating.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Omar Rojas whose telephone number is (571) 272-2357. The examiner can normally be reached on Monday-Friday (12:00PM-8:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rod Bovernick, can be reached on (571) 272-2344. The official facsimile number for regular and After Final communications is (571) 273-8300. The examiner's RightFAX number is (571) 273-2357.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR



Art Unit: 2874

system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Omar Rojas  
Patent Examiner  
Art Unit 2874

or

August 1, 2005



Rodney Bovernick  
Supervisory Patent Examiner  
Technology Center 2800